CLAIMS

1. An optical branching component comprising two optical waveguides coupled between two optical couplers, wherein there is an effective optical path length difference between the two waveguides, and wherein each said optical coupler comprises a multi-mode interference (MMI) waveguide configured to support at least two guided modes, and the coupling strength of at least one said optical coupler monotonically decreases with increasing wavelength in the operational wavelength region of the component.

2. An optical branching component according to claim 1, wherein the coupling strength of each said optical coupler monotonically decreases with increasing wavelength in the operational wavelength region of the component.

3. An optical branching component according to claim 1 or claim 2, wherein each MMI waveguide is configured to support only two guided modes.

4. An optical branching component according to any of claims 1 to 3, wherein the optical couplers each comprise an MMI coupler.

5. An optical branching component according to claim 4, wherein each of the MMI couplers has the same coupling strength.

6. An optical branching component according to claim 4, wherein each of the MMI couplers has a different coupling strength.

7. An optical branching component according to any of claims 4 to 6, wherein the phase thickness of each said MMI coupler is between 90° and 180 °.

8. An optical branching component according to claim 4, wherein the phase thickness of each said MMI coupler is between 90° and 135° and the phase delay, 2θ, between the two waveguides, between said two directional couplers, is defined by $90° < \theta < 180°$.

9. An optical branching component according to claim 4, wherein the phase thickness of each of said two MMI couplers is between 135° and 180 ° and the phase delay, 2θ, between the two waveguides, between said two MMI couplers, is defined by $0° < \theta < 90°$.

10. An optical branching component according to any preceding claim, wherein said effective optical path length difference is less than the shortest operating wavelength of the component.

11. An optical branching component according to any of claims 4 to 9, wherein the geometry of each MMI coupler is optimised to result in a minimum integrated RBE ($RBE_{average}$) of the coupler.

12. An optical branching component according to any of claims 4 to 9, wherein the magnitude of the integrated RBE ($RBE_{average}$) of each of said two MMI couplers is less than 1%.

13. An optical branching component according to any of claims 4 to 9, wherein the magnitude of the integrated RBE ($RBE_{average}$) of each of said two MMI couplers is no greater than 0.5%.

14. An optical branching component according to any preceding claim, wherein the component is a tap device having a tap ratio of no greater than 4%.

15. An optical branching component according to any preceding claim, wherein the component is a tap device in which the variation in the tap ratio with wavelength is less than 0.1% over the operating wavelength region of the component.

16. An optical branching component according to claim 1 or claim 2, wherein each said optical coupler comprises two optical waveguides which bend away from one another along at least a portion of their lengths and which are coupled together along at least a portion of their lengths by a respective said MMI waveguide, and which are in proximity with one another in at least one region adjacent said respective MMI waveguide in which region the waveguides are substantially straight.

17. An optical branching component according to claim 16, further including heater means disposed on at least one said waveguide.

18. An optical switching device comprising two optical branching components according to any of claims 1 to 16, further including at least one heater means.

19. An optical branching component comprising two optical waveguides coupled between two optical couplers, wherein there is an effective optical path length difference between the two waveguides, and wherein each said optical coupler comprises a multi-mode interference (MMI) waveguide configured to support at least two guided modes, and each said optical coupler is optimised to achieve a minimum polarization dependency of the said optical coupler.

20. An optical branching component according to claim 19, wherein the geometry of each said optical coupler is optimised to achieve a minimum polarization dependency of the said optical coupler.

21. An optical switching device according to any preceding claim, wherein the waveguides are fabricated in silica-on-silicon technology.

22. An optical coupler comprising two optical waveguides which bend away from one another along at least a portion of their lengths and which are coupled together along at least a portion of their lengths by at least one MMI waveguide which is configured to support at least two guided modes, and which are in proximity with one another in at least one region adjacent the MMI waveguide in which region the waveguides are substantially straight.

23. An optical coupler according to claim 22, comprising a single MMI waveguide configured to support only two guided modes.

24. An optical coupler according to claim 22, comprising two MMI waveguides each configured to support only two guided modes.